

# Geographical Economics

## Course 1: Topics in international trade (I)

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# Targets

- ▶ Introducing basic concepts
- ▶ Literature review
- ▶ Ricardian and HO Models

# "Mickey Mouse" toolkits

- ▶ Where does trade come from ?

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- ▶ Basic concepts in national account: GDP creation from the supply and demand approach

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- ▶ Where does trade come from ?
- ▶ Basic concepts in national account: GDP creation from the supply and demand approach
- ▶ Why does trade is good (if so) ?

# "Mickey Mouse" toolkits: trade and growth

- ▶ Terms of trade

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- ▶ Basic growth theory: the Solow-Swann model (ref. Barro & Sala-i-Martin)

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- ▶ Basic growth theory: the Solow-Swann model (ref. Barro & Sala-i-Martin)
- ▶ Exogenous vs Endogenous sources of growth



# "Mickey Mouse" toolkits: microeconomics

- ▶ Perfect competition

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- ▶ Perfect competition
- ▶ Monopolistic competition:  
Key issues: free entry condition & degree of competition

## "Mickey Mouse" toolkits: econometrics

- ▶ Panel data: macro and micro series.

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- ▶ Fixed effects

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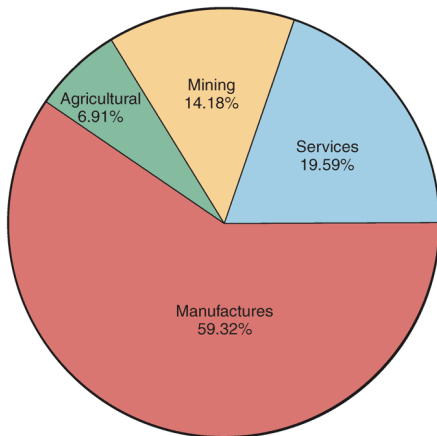
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- ▶ Fixed effects vs random model



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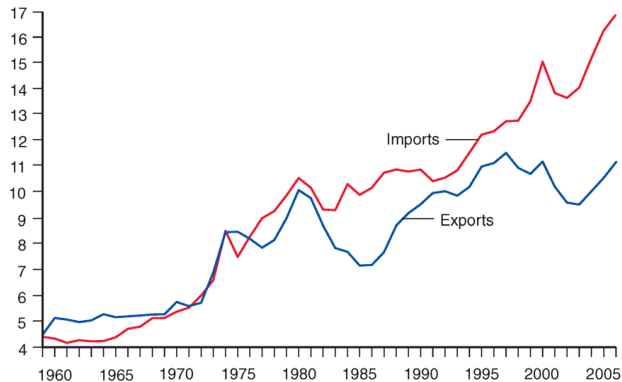
- ▶ Time dummies; collinearity;
- ▶ Coeff test
- ▶ F-test
- ▶ Fixed effects vs random model
- ▶ Cluster correction.

## Trade composition (2005)



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Exports, imports  
(percent of U.S.  
national income)



# Trade intensity (%GDP): source Catalunya

	Espanya						Estat Units			Amèrica		Àsia		Resta	
	(UE-27)	emanya	França	Itàlia	Portugal	Reine Unit	Europa	Suïssa	el Nord	EUA	al Sud	món	Japó	Xina	
2009	13,79	2,00	4,09	1,93	1,67	0,96	1,57	0,66	0,60	0,55	1,08	2,84	0,13	0,26	
2008	16,72	2,36	4,62	2,31	1,87	1,43	1,89	0,60	0,67	0,61	1,24	3,00	0,18	0,23	
2007	17,23	2,50	4,76	2,42	1,79	1,71	1,73	0,58	0,75	0,69	1,22	2,88	0,20	0,23	
2006	17,44	2,61	4,67	2,41	1,87	1,75	1,81	0,73	0,80	0,74	1,47	2,58	0,23	0,21	
2005	17,42	2,76	4,79	2,29	2,05	1,67	1,86	0,80	0,71	0,66	1,15	2,48	0,22	0,21	
2004	17,70	2,87	4,60	2,48	2,08	1,77	1,35	0,30	0,80	0,73	1,19	2,45	0,21	0,21	
2003	18,22	3,03	4,54	2,51	2,15	1,91	1,35	0,32	0,89	0,83	1,22	2,56	0,18	0,28	
2002	18,95	3,11	4,75	2,62	2,36	1,99	1,57	0,56	0,97	0,89	1,50	2,76	0,20	0,22	
2001	20,23	3,58	5,12	2,80	2,43	1,86	1,24	0,35	0,98	0,90	1,78	2,81	0,21	0,16	
2000	19,59	3,72	4,77	2,67	2,33	1,80	1,47	0,35	1,17	1,07	1,71	2,82	0,23	0,15	

## Trade direction: Catalunya (export)

	(UE-27)	emanya	França	Itàlia	Portugal	Irlanda	Reial Unit	Europa	Suïssa	Amèrica del Nord	Amèrica	Restat	Japó	Xina
2009	69,33	10,05	20,56	9,70	8,41	4,83	7,92	3,30	3,04	2,77	5,42	14,29	0,66	1,33
2008	71,09	10,04	19,64	9,83	7,94	6,08	8,02	2,54	2,85	2,60	5,27	12,77	0,79	0,96
2007	72,37	10,52	19,99	10,17	7,53	7,18	7,29	2,46	3,15	2,90	5,11	12,08	0,86	0,95
2006	72,34	10,84	19,38	9,99	7,78	7,25	7,50	3,05	3,33	3,05	6,10	10,72	0,95	0,88
2005	73,73	11,67	20,29	9,69	8,67	7,07	7,87	3,39	3,02	2,77	4,86	10,52	0,94	0,87
2004	75,37	12,24	19,59	10,56	8,86	7,55	5,73	1,28	3,41	3,12	5,07	10,42	0,89	0,91
2003	75,17	12,50	18,72	10,37	8,88	7,88	5,56	1,34	3,69	3,41	5,02	10,56	0,74	1,16
2002	73,57	12,07	18,44	10,17	9,15	7,74	6,09	2,16	3,78	3,44	5,84	10,72	0,77	0,86
2001	74,81	13,24	18,92	10,35	8,99	6,88	4,60	1,28	3,62	3,32	6,59	10,38	0,79	0,59
2000	73,20	13,89	17,81	9,97	8,70	6,74	5,48	1,31	4,38	4,01	6,40	10,54	0,86	0,55
1999	73,88	14,58	17,68	10,39	9,32	6,86	4,87	1,34	4,29	3,96	6,43	10,52	0,79	0,45
1998	73,49	15,25	17,20	10,86	8,47	6,85	5,15	1,41	3,87	3,50	6,98	10,51	0,77	0,51
1997	71,85	15,21	16,76	11,06	8,22	6,72	5,82	1,37	3,61	3,25	6,77	11,94	0,97	0,39
1996	73,08	16,21	18,97	10,33	7,75	6,33	4,79	1,39	3,32	3,02	5,88	12,92	1,34	0,74
1995	72,84	16,86	19,30	10,48	7,63	5,94	4,53	1,32	3,24	2,90	5,22	14,17	2,53	0,92
1994	71,62	15,27	19,14	10,83	7,49	6,35	4,44	1,52	3,66	3,31	6,47	13,81	2,44	0,61

# Trade direction: Catalunya (import)

	(UE-27)	emanya	França	Itàlia	Portugal	gine Unit	Europa	Suïssa	Amèrica del Nord	Amèrica	Restat	Resta	Japó	Xina
2009	60,51	17,05	11,75	9,78	2,14	3,31	5,78	1,93	3,59	3,30	4,72	25,39	2,33	7,93
2008	58,48	17,20	10,05	10,70	1,95	3,32	5,08	1,63	4,08	3,73	4,42	27,93	3,25	8,01
2007	62,00	18,52	10,61	11,40	1,78	3,52	5,06	1,35	3,36	3,21	3,65	25,93	3,95	7,06
2006	61,81	17,98	10,51	10,86	1,85	3,89	5,33	2,18	2,88	2,67	3,93	26,05	4,14	6,33
2005	64,26	18,51	11,61	10,97	1,69	4,62	5,62	2,58	2,85	2,49	3,25	24,03	4,60	6,03
2004	64,95	18,96	12,02	11,46	1,87	4,76	4,88	2,60	2,96	2,61	2,70	24,51	5,77	5,22
2003	65,85	19,80	12,30	11,42	1,95	5,11	4,38	2,35	3,17	2,95	2,79	23,82	5,23	4,73
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1999	68,23	18,92	13,81	12,31	1,65	6,14	3,03	1,75	4,09	3,77	3,03	21,62	5,45	3,77
1998	68,68	19,34	14,16	12,54	1,65	6,72	3,25	1,93	4,80	4,50	2,75	20,52	5,11	3,32
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- ▶ Firms produce goods by using ONE factor of production,
- ▶ In autarky all countries can produce all goods, but with a different technology,
- ▶ **Final equilibrium: full specialization.**

# Ricardo Model

Consider a world economy with two countries: **Home and Foreign.**

*Asterisk* denote variables related to the Foreign country.

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Consider a world economy with two countries: **Home and Foreign.**

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- ▶ Ricardian models differ from other neoclassical trade models in that there only is one factor of production.
- ▶ If a factor is perfectly mobile then its return will be equalized across countries (and hence not generate comparative advantage)

# Ricardo Model (I)

► We denote by:

$L$  and  $L^*$  the endowments of labor (in efficiency units) in the two countries.

$w$  and  $w^*$  the wages in the two countries.

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- ▶ We order goods such that  $A(z) \equiv \frac{a^*(z)}{a(z)}$  is decreasing.
- ▶ Hence Home has a comparative advantage in the low- $z$  goods. For simplicity, we'll assume strict monotonicity.

## Ricardo Model (III)

- ▶ Previous supply-side assumptions are all we need to make qualitative predictions about pattern of trade.

Let  $p(z)$  denote the price of good  $z$  under free trade.

Profitt-maximization requires:

$$p(z) - wa(z) \leq 0, \text{ with equality if } z \text{ is produced at Home}$$

$$p(z) - w^* a^*(z) \leq 0, \text{ with equality if } z \text{ is produced Abroad}$$

### Theorem

*Proposition: There exists  $\tilde{z} \in [0, 1]$  such that Home produces all goods  $z < \tilde{z}$  and Foreign produces all goods  $\tilde{z} > z$*

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## Discussion

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- ▶ Institutions and Ricardian framework (*Countries with “better institutions” tend to be relatively more productive, and it turns out they specialize in sectors that are more “institutionally dependent”*).
- ▶ Trade costs

## Trade costs

There is an abundance of evidence that international trade is impeded by significant trade costs. It is therefore attractive if a model permits the easy inclusion of trade costs— to potentially bring it closer to the data.

- ▶ TCs turn out to be easy to add to DFS 1977 (and other models) if we assume a particular ‘iceberg’ (Samuelson, 1954) form for TCs:

### Definition

Trade costs  $\tau > 1$  means that whenever one unit of a good is shipped internationally only  $1/\tau$  units arrive. ( $\tau = 1$  is free trade).

### Definition

Home will produce goods  $z$  that satisfy:  $w a(z) \leq \tau w^* a^*(z)$ . And Abroad will produce goods  $z$  that satisfy:  $w^* a^*(z) \leq \tau w a(z)$ .

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1. Production functions are identical in the two countries.
2. Households have identical preferences in the two countries.

## The Heckscher-Ohlin model (I)

Let us focus on the Home country.

The market clearing conditions imply (given  $a_j$ :factor requirement)

Profit max:

$$p_i \leq wa_{ij}(w, r) + ra_{aki}(w, r) \quad \text{with } i = 1, 2$$

$$p_i = wa_{ij}(w, r) + ra_{aki}(w, r) \quad \text{at the equilibrium}$$

Therefore, the market-clearing condition:

$$l = y_1 a_{l1}(w, r) + y_2 a_{l2}(w, r)$$

$$k = y_1 a_{k1}(w, r) + y_2 a_{k2}(w, r)$$

## The Heckscher-Ohlin model: results

We will derive the 'classical' H-O results:

### Theorem

*Factor Price Insensitivity (FPI) : If both goods are produced in equilibrium and there exists a unique setting of factor prices, then factor prices  $w$  ( $w, r$ ) are uniquely determined by good prices  $p$  ( $p_1, p_2$ ).*

# The Heckscher-Ohlin model: results

## Theorem

*Factor Price Equalization (FPE): If two countries produce both goods under free trade with the same technology and there exists a unique setting of factor prices, then they must have the same factor prices.*



# The Heckscher-Ohlin model: results

## Theorem

*Stolper-Samuelson: An increase in the relative price of a good will increase the real return to the factor used intensively in that good, and reduced the real return to the other factor.*

# The Heckscher-Ohlin model: results

## Theorem

*Rybczinski : An increase in the endowment of one factor will increase the output of the industry using that factor intensively, and decrease the output of the other industry.*

# Empirical evidence

- ▶ The HO model experiences hard times in finding empirical support

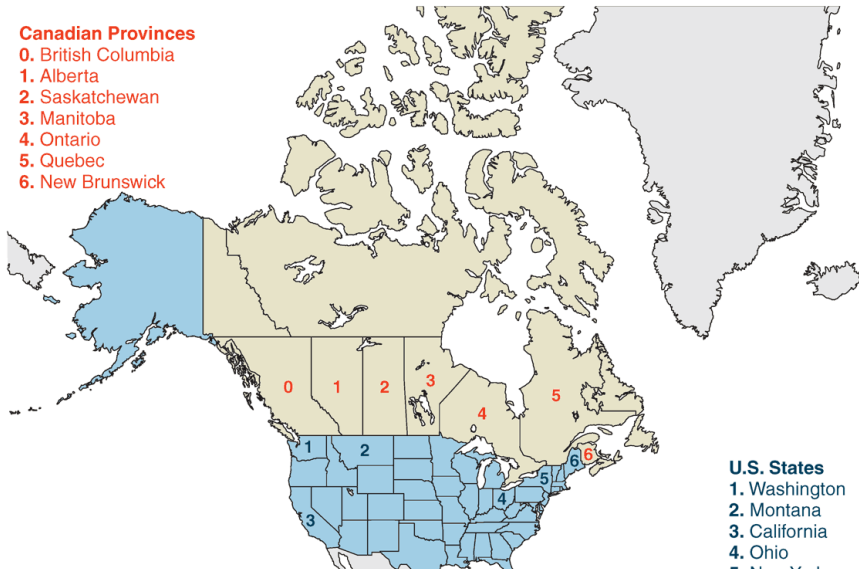
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- ▶ Leontief's paradox
- ▶ What does it say empirical evidence ?

# Empirical evidence: distance matters



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- ▶ Larger economies generate more income from the goods and services sold, so people are able to buy more imports

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2. Distance may also influence personal contact and communication, which may influence trade.
3. *Cultural affinity*: if two countries have cultural ties, it is likely that they also have strong economic ties
4. *Geography*: ocean harbors and a lack of mountain barriers make transportation and trade easier.

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- ▶ *Borders*: crossing borders involves formalities that take time and perhaps monetary costs like tariffs.
- ▶ These implicit and explicit costs reduce trade.
- ▶ The existence of borders may also indicate the existence of different languages (see 2) or different currencies, either of which may impede trade more.

## Empirical evidence: the gravity equation

In its basic form, the gravity model assumes

$$E_{ij} = A \frac{Y_i Y_j}{D_{ij}}$$

where

$E_{ij}$  : is the value of trade between country i and country j

$A$  : is a constant

$Y_i$  : the GDP of country i

$Y_j$  : is the GDP of country j

$D_{ij}$  : is the distance between country i and country j

## Empirical evidence: the gravity equation

The estimated model turns out to be:

$$\ln E_{ij} = \beta_0 \ln A + \beta_1 \ln Y_i + \beta_2 \ln Y_j - \beta_3 \ln D_{ij} + \beta_4 \text{Border} + \beta_5 \text{Cultural} + \beta_n D_T + \varepsilon_{ij}$$

and several other augmented versions.

Pay attention:  $\beta_4 \sim 1.1$

## Empirical evidence: the gravity equation (estimates)

- ▶ Discussion estimations from Martinez -Zarzoso and Nowak-Lehemann (2003, JAE)

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- ▶ Discussion estimations from Martinez -Zarzoso and Nowak-Lehemann (2003, JAE)
- ▶ Common drawbacks for gravity estimations.

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## Empirical evidence: the gravity equation (theory)

- ▶ The regularities detected by the gravity equation claim for a novel theoretical setting,
- ▶ Anderson (1979) and Anderson and van Wicoop (2004) provide a new framework of analysis,
- ▶ This framework relies on the introduction of imperfect competition and transport costs.....